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Exploring metaverse online platform "Gather.Town" for collaborative learning activities to improve participants' engagement in adolescent health workshop intervention

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ABSTRACT

Introduction: Health-related behavior in adolescents gives significant impact on their future health and the next generation. Some interventions toward adolescents' health-related behaviors have resulted ineffectively, owing to status and respect sensitivity in adolescents' uniqueness. Covid-19 pandemic caused restrictions to face-to-face meetings and educational activities. The "gather.town" metaverse was used to construct an online event platform that included attractive and interactive educational workshops to induce collaborative learning activities for adolescents, as a result of on Human Centered Design process that starts with adolescents and ends with tailored innovative solutions to improve their health. This study aims to explore the use "gather.town" as a metaverse online platform to engage with adolescents during intervention to improve.

Methods: The intervention was designed and organized by a student-led organization using a metaverse online platform "gather.town" to reach out to adolescents in Indonesia, consisting of ten workshops, each demonstrating a health topic with a skill-learning approach using interesting activity guided by a pair of knowledgeable speakers. Moreover, "gather.town" offers unique options such as creating individual avatar and interacting with people outside the workshop rooms during the event. The main event was divided into morning and afternoon sessions with a total of 140 adolescents from different areas and educational backgrounds in Indonesia.

Results: Only 47% of participants gave feedback through online evaluation from. All participants were satisfied with the workshops. Thirteen percent of participants were unsatisfied with the "gather.town" platform.

Conclusion: Using a human-centered design approach to combine skills and health knowledge increases adolescents' interest to join the intervention. Future interventions may consider exploring other user-friendly platforms and total number of activities to accommodate more participants in each workshop.

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INTRODUCTION

The World Health Organization (WHO) defines adolescence as a human being between 10 and 19 years, while young people start from the 10 to 24 years age group. Adolescent age can further be divided into early adolescence, or 10-14 years, mid adolescent, or 15-19 years, and late adolescence/young adulthood, or 20-24 years. Each category describes different emotional and psychological development where early adolescence predominates puberty, affecting pubertal hormones on body, sexual, and brain development.

Mid-adolescence features the prefrontal cortex development, which may bring various risk behaviors. Late adolescence and young adulthood are characterized by prefrontal cortex maturation and self-regulatory functions, therefore adopting adult roles and responsibilities.[1,2]

Social determinants of health (SDH) towards adolescents involve the transitions in some domains, which it is shaped by families, communities, and resources. One of the structural SDH is health behaviors relating to substance abuse, sex, diet, exercise, and ultimately self-management of chronic diseases, including non-communicable diseases (NCDs).[3]

Various risky behaviors in adolescents, especially health-related behaviors, have a significant impact not only on their future health, but also on their next generation. This correlation originates from the influences between future paternal and maternal assets (social, financial, and education) combined with risks such as nutrition, health, and interpersonal skills. Furthermore, both paternal and maternal health behaviors may also indirectly affect offspring development in future generations.[4]

The majority of deaths in Indonesia

are caused by non-communicable diseases (NCDs), followed by communicable diseases and nutritional conditions. In 2019, stroke was the leading cause of death in Indonesia, with 131.80 deaths per 100,000 population, followed by ischemic heart disease (95.68 deaths per 100,000), and diabetes mellitus (40.78 deaths per 100,000).[5] A considerable number of NCD deaths explains how important health-related behaviors in adolescents are in affecting future impact and their quality of life.

Pubertal maturation in adolescents shows greater sensitivity to status and respect, an ability to align attention, motivation, and behavior regarding potential-rewarding feelings due to attaining status or respect. Pubertal hormones, specifically testosterone, cause this behavior; moreover, traditional interventions are usually less effective owing to "what" and "how" the intervention is delivered. Imparting information that adolescents feel they already have, repeatedly over multiple sessions and in multiple forms, may come across as infantilizing and therefore disrespectful.[6] Adolescent behavior is also influenced by brain development and its susceptibility to social and environmental cues.[7] Some interventions towards adolescents, such as youth centers, peer education, and one-off public meetings, have been shown to be ineffective in bringing about behavior changes.[8]

Human-centered design (HCD) is a problem-solving approach that maintains perspective and participation at the same time, resulting in an inclusive approach towards participants. Intervention using HCD brings a different method than the traditional one, which allows a combination of skills and knowledge to participate in the process and gives meaningful participation.[9]

Meaningful adolescent or youth participation is defined as an inclusive, intentional, and mutually respectful partnership between adolescents, youth, or adults where there are shared capacities such as contributions, power, ideas, perspectives, skills, and strengths. Numerous shared capacities are then unified into design and delivery of programs.[10] HCD in adolescent health starts with adolescents and ends with tailored innovative solutions to improve their health. HCD approach in designing adolescent health intervention is an effective way of getting solutions from adolescents and to let them have meaningful participation.[11,12]

The global epidemic of Coronavirus Disease 2019 (COVID-19) has presented several threats to public health, along with educational activities, where most are forced to switch online by using numerous platforms.[13] The online platform "gather.town" is one of the metaverse video chat online platforms that uses 2D maps and avatars where users can interact with each other, resembling reality.[14] Unlike most platforms, "gather.town" does not restrict a certain type of activity; furthermore, users can interact with their virtual surroundings (spaces) using customizable avatars. This platform's perception of higher interaction may lead to higher participation and cohesiveness.[15,16]

Adolescents are a critical age group, and this period causes major changes in health and health-related behaviors, and most people, even youth themself, neglect it.[2] Raising people's awareness about what adolescents face is needed to improve adolescents' health by increasing their knowledge. This study aims to explore metaverse online intervention using "gather.town" to better engage with adolescents and raise awareness on their health.

METHOD

REPLIKA, a medical student organization of Universitas Pelita Harapan, planned an event to commemorate International Adolescent Health Week in March 2022. The goal is to enhance Indonesian teenagers' awareness of health by addressing brain development and behavior. Adolescent health issues, include unhealthy lifestyle, mental health, and sexual and reproductive health, are linked like a puzzle. Based on rapid inquiry, adolescents assume they are healthy, and most health concerns will develop when they become adults. After 2 years of the pandemic, adolescents are bored with online educational sessions but are interested in acquiring new skills. Thus, we created an online workshop to teach adolescents new skills while raising health awareness.

This intervention had 10 morning and afternoon workshops. Each workshop includes fun activities led by the speaker, such as learning about healthy eating through food photography, discussing tobacco control while learning about financial planning, and more (Table 1). These events featured UPH Faculty of Medicine lecturers and adolescent-focused NGOs.

After considering a few online platforms such as Zoom, Teams, and Meet, we settled on "Gather.town" as the platform that would allow us to create personalized avatars and network with attendees outside of the workshop rooms. The target group consisted mostly of adults and young adults (between the ages of 14 and 25), and we aimed for a batch size of approximately 200 users. We tested these tools with our team prior to the "gathertown" gathering, and we gave new participants a brief introduction so they could use the tools as well. We prepared an

Table 1. Topics and activities in the workshops

Workshops	
Topic	Activity
Healthy Eating	Food Photography
Healthy Exercise	Exercise Coaching Clinic
Tobacco Control	Financial Planning
Equal Rights to Healthcare	How to Make a Podcast
Dating Violence	Content Creating
Road Safety Awareness	Defensive driving
Emotional Management	Digital Drawing
Distress Tolerance	Emotion Regulation
Menstrual Hygiene	Eco Fashion
Self-Harm and Suicide	Good Listener

online evaluation form to collect feedback from participants.

This study has ethical clearance from the Faculty of Medicine, Universitas Pelita Harapan, ethical committee no. 168/K-LKJ/ETIK/VIII/2023.

RESULT

A total of 210 participants registered for the workshops (Table 2), but only 140 (66.6%) managed to participate.

By the end of the event, only 66 participants (47%) gave feedback responses through an online evaluation form. Quantitative results were obtained using a rating scale based on the throughout process of the event by the participants. Four scales of response in the rating scale were used, such as "very good", "good", "poor", and "very poor". The evaluation includes the registration process, the "gather.town" platform, the workshop itself, experts guiding the workshops, and information about the event (Figure 1).

Participants' qualitative feedback was categorized into three themes: the workshop, the platform used, and the experts. Most participants provided positive feedback on the workshop's concepts and its originality. Some participants appreciate the platform because it is entertaining and engaging, while others find it difficult to use due to technical issues.

DISCUSSION

Adolescents have distinct health behaviors due to brain development. Complex adolescent health issues are often disregarded. Adolescent health interventions should begin with health awareness. HCD-based interventions for adolescents may be a better strategy to engage them in health improvement actively. It provided a space for adolescents to express their needs and aspirations, access capabilities, and preferences, and let them take the lead to create and evaluate the program while providing a structure to integrate and blend expertise to ensure the intervention was grounded in the adolescent health evidence and best practice.[11] A student-led organization and lecturers as supervisors collaborated to develop the event, sharing viewpoints and contributions to deliver such an intervention.

We mostly conducted qualitative evaluations with the participants in order to obtain good feedback. Workshops combining skills enhancement and health education are effective in increasing adolescents' engagement rather than passively listening to educational sessions. Adolescents need space to show their creativity and to learn new skills. Applying HCD throughout the process of designing, implementation, and evaluation stages of the intervention can help the team to learn adaptive learning and iteration, allowing for improvements by promoting rapid and informed decision making about which intervention elements need to be strengthened or abandoned.[11]

Table 2. Demographic data of registered participants

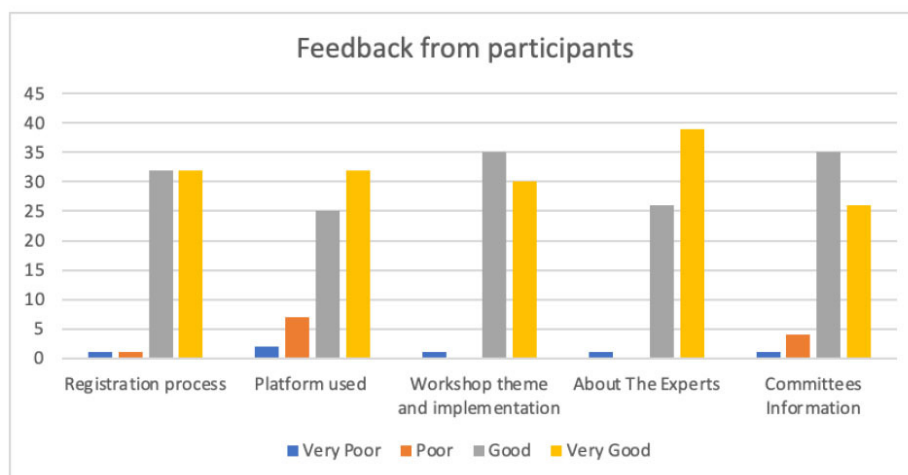| Participants' demography	%
Sex	
Male	53 (25.20)
Female	157 (74.80)
Age	
10-14 years	11 (5.23)
15-19 years	59 (28.09)
20-24 years	49 (23.33)
>24 (25-70) years	91 (43.33)

Figure 1. Quantitative feedback response of participants regarding the intervention.

Table 3. Qualitative feedback response of participants regarding the intervention

Category	Several Responses from the Participants
Workshop	"Very good, the concept is unique too. Thank you for the useful and informative event."
	"It's very beneficial for me as an adolescent, now I have knowledge to keep up with the era."
	"The event gave me relevant knowledge that is useful for my daily."
	"The workshop topic was out of the box but still relevant, such as, combining information about tobacco control with financial planning skill."
Platform	"The platform is exciting, interactive, and unique."
	"It's different than the usual webinars where we get to use avatars and interactions like playing game inside it."
	"The platform that is being used are still new for me, it's difficult to adapt and follow through it."
	"Even though the topics are good but I'm having difficulties about the platform."
Experts	"The experts are really giving me new insights."

The use of metaverse platforms provides a novel method for engaging adolescents. Self-participation in the workshop was enhanced by characteristics such as the ability to create avatars and interact with them on an individual level.[14] Even though there were only 140 participants in the event, adolescents were able to actively engage by following the workshop's topic and participating in activities related to the theme, thereby increasing their knowledge of adolescent health.

Although "gather.town" has received a great deal of praise for its uniqueness, it is also the workshop's limitation. During the workshop, some participants found the platform challenging to use because they were unfamiliar with it, and both participants and committees experienced lag due to unstable signals. Another limitation is that broad subject matter and many concurrent workshops result in an excessive burden for committees and a lack of focus for participants. A more focused message can be conveyed by focusing on fewer issues and avoiding those that are too broad.

CONCLUSION

The utilization of the HCD technique in developing adolescent health interventions has introduced innovative concepts through the implementation of the Metaverse online platform known as "gather.town". Both the HCD approach and the platform used have demonstrated promising results in promoting youth participation throughout the process and increasing adolescents' interest in participating in the event. Future interventions for adolescent health may consider the number of activities to accommodate more participants per workshop.

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CONFLICT OF INTERESTS

The authors declare no conflict of interests, such as any financial, professional, or personal relationships that are relevant to this work.

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AUTHOR CONTRIBUTION

(1) Substantial contributions to conception and design; acquisition of data, analysis, and interpretation of data; final approval of the version to be published.

(2) and (3) Drafting the article; acquisition of data, or analysis and interpretation of data.

(4) Revising it critically for important intellectual content and final approval of the version to be published.

REFERENCES

1. Patton GC, Sawyer SM, Santelli JS, et al. Our future: a Lancet commission on adolescent health and wellbeing. The Lancet. 2016; 387: 2423-78. DOI: 10.1016/s0140-6736(16)00579-1.

2. Spear LP. The adolescent brain and age-related behavioral manifestations. Neuroscience & Biobehavioral Reviews. 2000; 24: 417-63. DOI: 10.1016/s0149-7634(00)00014-2.

3. Viner RM, Ozer EM, Denny S, et al. Adolescence and the social determinants of health. Lancet. 2012; 379: 1641-52. 20120425. DOI: 10.1016/S0140-6736(12)60149-4.

4. Patton GC, Olsson CA, Skirbekk V, et al. Adolescence and the next generation. Nature. 2018; 554: 458-66. DOI: 10.1038/nature25759.

5. Global Health Estimates 2019: deaths by cause, age, sex, by country and by region, 2000-2019 [internet]; 2020. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-leading-causes-of-death.

6. Yeager DS, Dahl RE and Dweck CS. Why interventions to influence adolescent behavior often fail but could succeed. Perspect Psychol. Sci. 2018; 13: 101-122. 20171212. DOI: 10.1177/1745691617722620.

7. Blakemore SJ and Mills KL. Is adolescence a sensitive period for sociocultural processing?. Annu Rev Psychol. 2014; 65: 187-207. 20130906. DOI: 10.1146/annurev-psych-010213-115202.

8. Chandra-Mouli V, Lane C and Wong S. What does not work in adolescent sexual and reproductive health: A review of evidence on interventions commonly accepted as best practices. Global Health: Science and Practice. 2015; 3: 333-40. DOI: 10.9745/ghsp-d-15-00126.

9. UNICEF. Human centered design 4 health [internet]. Accessed 2 January 2022. Available from: https://www.hcd4health.org/

10. PMNCH. Global consensus statement meaningful adolescent & youth engagement [internet]; 2020. Available from: https://pmnch.who.int/resources/publications/m/item/global-consensus-statement-on-meaningful-adolescent-and-youth-engagement

11. Ippoliti N, Sekamana M, Baringer L, et al. Using human-centered design to develop, launch, and evaluate a national digital health platform to improve reproductive health for Rwandan youth. Global Health: Science and Practice. 2021; 9: S244-S260. DOI: 10.9745/ghsp-d-21-00220.

12. Fakoya I, Cole C, Larkin C, et al. Enhancing human-centered design with youth-led participatory action research approaches for adolescent sexual and reproductive health programming. Health Promot Pract. 2022; 23: 25-31. 20210415. DOI: 10.1177/15248399211003544.

13. Maatuk AM, Elberkawi EK, Aljawarneh S, et al. The COVID-19 pandemic and e-learning: Challenges and opportunities from the perspective of students and instructors. Journal of Computing in Higher Education. 2022; 34: 21-38. DOI: 10.1007/s12528-021-09274-2.

14. Lee Y, Jung J-H, Kim H, et al. Comparative case study of teamwork on zoom and Gather.Town. Sustainability. 2023; 15: 1629. DOI: 10.3390/su15021629.

15. Hwang Y, Shin D and Lee H. Students' perception on immersive learning through 2D and 3D metaverse platforms. Educational technology research and development. Educ Technol Res Dev. 2023; 1-22. DOI: 10.1007/s11423-023-10238-9.

16. Palos-Sanchez PR, Baena-Luna P and Silva-O'Connor D. Exploring employees' beliefs regarding the potential benefits of virtual worlds for group cohesion: gather town. Multimedia Tools and Applications. 2022. DOI: 10.1007/s11042-022-14308-7.